Medicines Use by the Older-Aged Living Independently in Different Types of Retirement Villages

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ABSTRACT

Background: Resources to assist the older-aged manage their medicines should target those in greatest need. Little is known about whether socioeconomic status (SES) influences medicines management by the older-aged.

Aim: To explore whether there is a difference in medicines management by the older-aged living independently in different types of retirement villages.

Method: Semi-structured interviews were conducted with 56 older-aged residents living in 5 different types of retirement villages. A purposefully designed instrument was used to inform the researchers' perceptions of medication adherence.

Results: 92% of older-aged participants from the freehold retirement village (high SES) were adherent and not likely to have problems with adherence within the next 6 to 12 months. While in the 2 rental retirement villages (low SES), 50% of the residents or less were perceived to be adherent. Participants from the freehold retirement village (metropolitan city) had a good understanding of about 80% of their illnesses, which was significantly lower in the rental villages **[insert % range]**. More medicines per person were prescribed in the 2 rental retirement villages than in the freehold village. Cardiovascular drugs were the most commonly prescribed in all retirement villages, but prescribing of psychotropic medicines was greater in rental than freehold villages. Pooled data showed that lack of knowledge about medicines and illness was associated with a medication organiser dispensed by a pharmacy.

Conclusion: The older-aged living in low SES rental retirement villages may need assistance/resources to manage their medicines.

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INTRODUCTION

The WHO estimates that 50% of the poulation with chronic diseases do not take their medicines.[1] Among the older-aged, non-adherence is a serious issue because there is an increased burden of symptoms and disease, leading to the use of more medicines and a greater chance of non-adherence.[2] Ratified estimates of non-adherence in this cohort vary from 40% to 75%.[2] Medicines management by the older-aged, especially adherence is important, as non-adherence is a common cause of hospital admissions and disease progression.[3] A review of medicines adherence in the older-aged reported that little attention had been given to the relationship between medicines management and living conditions and/or socioeconomic status (SES).[3]

Most retirement villages have common features: retirement element – residents are no longer in full-time employment which affects their use of time and space; community element – an age-specific population, living in the same geographically bound area; degree of collectivity – with which residents identify and may include shared activities, interests and facilities; and a sense of autonomy and security.[4,5] In independent-living retirement villages, older-aged residents are responsible for their own care, and accommodation is in self-care units, with other services available at additional cost.[5] Living in a retirement village with ready access to social support has been shown to have a positive effect on the physical and mental health of most residents and was attributed to peer culture **[rephrase?]**.[4,6]

In Australia, health outcomes are poorer outside of the metropolitan areas, possibly because of differences in access to services between metropolitan and regional/remote areas.[7] Therefore, this study aimed to explore whether there is a difference in medicines management by the older-aged living independently in different types of retirement villages.

METHOD

Selection of Retirement Villages

A variety of retirement villages were selected to provide a range of types and SES. To ascertain the differences in adherence and medicine use by the older-aged, similar retirement villages were chosen in metropolitan and regional areas.

The first type was the freehold retirement village, where the land and the villa were owned by the resident. These villas were self-contained and separated from other villas. The residents living in freehold villages were self-catering. The SES scores for the postcode of the freehold retirement villages were in the range 101 to 125 (the higher the number the higher the SES).[8]

The second type was the leasehold retirement village, where the land belonged to the company that operated the retirement village but the resident owned the house. Two leasehold properties were selected that were self-contained and ranged in style from freestanding to unit-style residences. Both of these retirement villages were owned and managed by the same company. One of the leasehold villages was metropolitan (SES range 94 to 110) and the other was regional (SES range 101 to 103).[8]

The third type was the rental retirement village, where the residents rented their units, and the meals were provided as part of the weekly cost. Although both of the selected rental villages were built and initially run by the same company, at the time of the study they were independently owned by conglomerates **[rephrase]**. These rental retirement villages had lower SES scores – 79 to 88 for the metropolitan village and 88 to 91 for the regional village.[8]

We were given permission by the five retirement villages to conduct the study, as well as ethical approval from the Queensland University of Technology Human Ethics Committee.

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Recruitment

The President of the Residents Association of the freehold retirement village gave permission to contact the older-aged by telephone, whereas the manager of the rental retirement village (metropolitan city) gave permission to contact the older-aged by door-knocking. The managers of the other three retirement villages (2 leasehold, 1 rental) gave permission to only contact those older-aged that had expressed an interest in participating after seeing an advertisement for the project. **[clarify]**.

In the freehold village, 16 of the 30 residents were contacted by telephone, and 13 agreed to participate (81%). Those that declined appeared to have difficulty understanding the telephone call, and English was the second language for two residents. The leasehold retirement villages had 168 and 162 houses/units/apartments in the metropolitan and regional villages, respectively. Only a few older-aged from these large villages volunteered to participate: five and three from city and regional villages, respectively.

The rental, catered villages were mid-range in size: 60 and 50 units in the metropolitan city and regional areas, respectively. At the city rental village, 25 of the 36 older-aged, who responded to our door knock, agreed to participate (69%). At the regional rental village, 10 older-aged from the 50 units, gave their names to the manager as being interested in the study, and they subsequently agreed to participate (20%). **[Move no. of respondents to Results?]**

Interview

Semi-structured interviews were conducted by two researchers in the homes of consenting residents. The first part of the interview verified whether the residents were living independently and the second part ascertained their age and information about their medical conditions and medicines. Participants were requested to show their medicine cabinet/store and medicines were discussed in detail.

Expression and Calculation of Results

Present and Ongoing Adherence

A semi-structured questioning method was developed to inform perceptions of medication adherence (refer the on-line supplement **<insert web page>)**. When the interviews were completed, each researcher wrote five sentences about each participant, describing their ability to manage their medicines. These five sentences formed the basis for a discussion between the researchers of their perception of the present and ongoing medication adherence of the participants. When researchers reached consensus, participants were classified into one of four categories:

A. adherent and unlikely to have problems with adherence in next 6 to 12 months;
B. adherent but at risk of nonadherence in next 6 months;
C. adherent but at immediate risk of nonadherence; and
D. nonadherent and at immediate risk.

Knowledge of Medical Condition

Residents were asked on two occasions, whether they knew for which illnesses (medical conditions) they were taking medicines – once without the medicine present, and again while looking at and discussing each medication. For each medical condition, participants' knowledge was classified as 'good' (knowing exactly which illness/es they had), 'some' (having some knowledge but it was not precise) or 'no' (having no knowledge of their illness/es). Percentages for each of these categories of knowledge was calculated.

Medicines

Medicines were classified according to their therapeutic classification from the *Australian Medicines Handbook*.

Data were analysed using Excel 2010 to determine, averages, standard deviation, standard error, t-tests and variance.

RESULTS

There were 56 participants – 13 from the high SES freehold retirement village (metropolitan city), 25 from the low SES rental retirement village (metropolitan city), 10 from the low SES rental retirement village (regional city), and up to 5 from leasehold villages in both areas [rephrase].

Participants' age was distributed similarly between the retirement villages (Table 1). More participants in the freehold and leasehold villages had been hospitalised within the previous 6 months compared to rental villages (Table 1).

Table 1. Age, gender, recent hospitalisation and (perception of) present and ongoing adherence of older-aged participants

Variables	Freehold, self-catering, metropolitan city (n = 13)	Leasehold, self-catering, metropolitan city (n = 5)	Leasehold, self-catering/catered, regional city (n = 3)	Rental, catered, metropolitan city (n = 25)	Rental, catered, regional city (n = 10)
Male/female	6/7	1/4	0/3	9/16	3/7
Age (years)					
< 75	38%	20%	33%	44%	30%
≥ 75	62%	80%	67%	56%	70%
Hospitalised in previous 6 months	38%	40%	33%	24%	20%
Perception of adherence					
A: adherent and unlikely to have problems with adherence in next 6-12 months	92	60	0	40	50
B: adherent but at risk of nonadherence in next 6 months	0	20%	67%	24%	20%
C: adherent but at immediate risk of nonadherence	8%	20%	33%	12%	0
D: nonadherent and at immediate risk	0	0	0	24%	30%

Adherence was calculated as percentage of participants in each village type.

Present and Ongoing Adherence

There were minor variations in the researchers' perceptions of the ability of the participants to adhere to medicines. There were no differences between the researchers in categorising participants to levels of adherence (A, B, C, D).

Most residents (92%) in the freehold village were perceived to be adherent and unlikely to have adherence issues within the next 6 to 12 months (Table 1). In contrast, 50% or fewer residents in rental villages were in this category (Table 1).

Due to low numbers of participants from leasehold villages, data are not included on the comparison between the freehold (high SES) and rental (low SES) villages in a metropolitan and regional city. **[move elsewhere?]**

Medicine Collection and Medication Organiser

Fewer participants in the rental villages collected their medicines from a pharmacy compared to the freehold village (Table 2). The majority of participants at freehold and rental villages were not using a medication organiser. When medication organisers were used, there were no clear differences in their use between villages (Table 2).

Knowledge of Medical Condition

Participants from the freehold village (metropolitan city) had a good understanding of about 80% of the illnesses for which they were prescribed medicines (Figure 1). This was significantly lower (ANOVA, p = 0.01) in the rental villages (Figure 1). Conversely, the percentage of residents living in the rental villages who had no knowledge of these illnesses was significantly higher (~30%, ANOVA, p = 0.04) than in the freehold village (Figure 1).

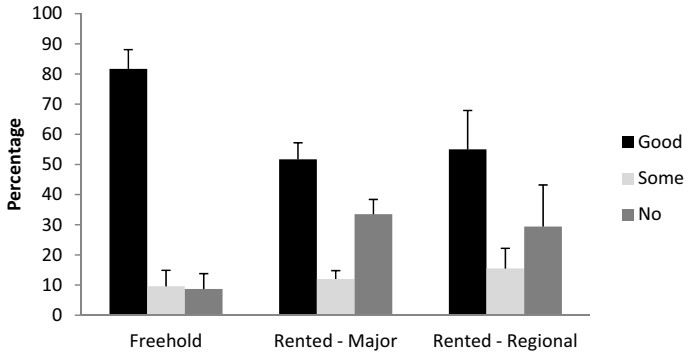

Figure 1. Knowledge of illness for which older-aged participants were prescribed medicines.

When data from all of the villages **[3 or 5??]** were combined it was found that the 11 participants using a medication organiser dispensed from a pharmacy had no knowledge of 60% ± 9 of their illnesses, whereas this was only 16% ± 3 (p < 0.001) among the 45 residents who looked after their own medicine taking. Conversely, residents who looked after their own medicine taking had a good knowledge of 69% ± 4 of their illnesses.

Table 2. Medication management in freehold and rental retirement villages

Variables	Freehold, self-catering, metropolitan city (n = 13)	Rental, catered, metropolitan city (n = 25)	Rental, catered, regional city (n = 10)
Medication collection			
Self	77%	56%	50%
Friend/relative	23%	4%	10%
Pharmacy delivers	0	40	40%
Medication organiser			
No	77%	60%	80%
Packed by pharmacy/ carer	15%	32%	20%
Self-packed	8%	8%	0
No. of medicines			
Prescription medicines/person	4.7 ± 0.7	7.4 ± 0.6	6.7 ± 0.08*
Non-prescription medicines/person	1.1 ± 0.03	1.2 ± 0.4	1.3 ± 0.02
Medicines prescribed as percentage of participants receiving class			
Cardiovascular/anti-thrombotic	77%	92%	90%
Endocrine	42%	32%	40%
Respiratory	25%	4%	20%
Gastrointestinal	25%	48%	70%
Musculoskeletal	25%	8%	30%
Analgesics	17%	44%	30%
Psychotropic and neurologic	8%	56%	40%

*ANOVA: single factor, p = 0.04

Medicines Use

More medicines per person were prescribed to residents in the two rental villages than the freehold village (Table 2). In contrast, there was no difference in the mean number of non-prescription medicines between the freehold and the two rental villages (Table 2).

The medicines most frequently prescribed at the freehold and rental villages were cardiovascular drugs (Table 2). Of the residents taking cardiovascular/anti-thrombotic drugs, more drugs were prescribed per person in the rental metropolitan village (3.6 ± 0.4; n = 23) than in the rental regional village (2.6 ± 0.3; n = 10) and the freehold village (1.9 ± 0.3; n = 11). More psychotropic/ neurologic drugs were prescribed to residents in the two rental villages than the freehold village (Table 2). This difference reflected the use of more psychotropic drugs in the rental but not the freehold villages. None of the residents in the freehold village were taking psychotropic drugs but 12 (n = 25) residents in the rental village (metropolitan city) and 1 (n = 10) at the rental village (regional city) were taking psychotropic drugs.

Major vs Regional City Rental Retirement Village

There were no differences in the knowledge of illness (Figure 1), adherence (Table 1), medication collection, number of prescription and non-prescription medicines, and percentage taking cardiovascular drugs (Table 2).

DISCUSSION

A major limitation of this study was the low number of residents from the leasehold retirement villages who volunteered to participate in the study. Less weight has been given to the results from these villages, and differences between the freehold and rental villages are discussed in more depth. Another limitation was that we had to negotiate with the president or manager of the retirement villages regarding our initial contact with the

residents of the villages. Consequently, our initial contact with the residents was different between the villages and may have resulted in selection bias. However, all of the interviews were conducteded in a similar manner in the homes of consenting residents.

Many methods (e.g. biological assays, pill counts, electronic monitoring, pharmacy records/prescription records, patient interviews, patient estimates of adherence, medication adherence self-efficacy scales) have been used to measure adherence to medicines, and these have problems associated with them **[rephrase].**[9] Patient interviews can overestimate adherence and subjective assessments by the interviewers can bias the estimated adherence.[9] DiMatteo[10] demonstrated that self-reported adherence produced similar results to these other approaches.

We wanted to ascertain present and ongoing adherence, and to our knowledge, no methods have been described for this **[?]**. To ascertain present and ongoing adherence, and to reduce interviewer bias, interviews were conducted by two researchers. For purposes of logistics, when measuring adherence, a variation of the **[standardised?]** interview method was used, and residents' adherence was classified on the basis of the independent perceptions of the two researchers. From the residents' responses to the semi-structured, researcher-led, informal interview, the researchers independently recorded their perception of adherence. Subsequently, the researchers compared notes, and classified the subjects into a category from A (adherent) to D (nonadherent). With this method, there was complete agreement between the researchers. However, as the interview provided the context for data collection, it remains possible that adherence was overestimated **[rephrase]**.

Our results suggest significant differences in adherence to medicines between residents living in a freehold (high SES) and two rental (low SES) retirement villages. The authors perceived that most of the residents living in the freehold (metropolitan city) village were adherent and unlikely to have adherence issues in the next 6 to 12 months. However, only a few residents from the two rental villages were in this category. Conversely, none of the residents from the freehold village and 24% to 30% in rental retirement villages were perceived as being nonadherent and at immediate risk of nonadherence in the future (immediately and/or in the next 6-12 months) **[is what you mean?]** Risks would be those associated with nonadherence, e.g. hospital admission, disease progression.[3] As our method may have overestimated adherence, this low level of adherence in rental retirement villages is a major concern.

The only major difference between the retirement villages was that the residents in the rental villages were provided with meals. Residents living in a catered facility could be considered a different population (less well) than those in self-catering facilities, and may explain the differences in adherence and medicines rather than relating these differences to the SES of the retirement village **[rephrase]**. However, the age range of these groups was similar, suggesting a similar population in the freehold and rental villages. Therefore, the differences in adherence and medicines may be related to the SES of the village. Alternatively, the presence of catering (for those unable to cater) underscores the differences between the populations, manifesting as lower adherence in the rental catered facility. This could be tested by comparing catered and self-catered populations in the same type of village, to determine whether catering and/or associated reduced independence are associated with changes in the use of medicines **[what does this mean?]**. Regardless, our findings indicate that residents living in rental retirement villages need increased support to manage their medicines.

Differences in medicines management between residents in the different types of retirement villages (freehold, leasehold, rental [catered]) were investigated, as few studies have considered medicine use in these villages. The median number of prescription medicines for men and women aged 65 years and over and living in their own homes in New Zealand was six and seven, respectively.[11] For an older age group (≥ 75 years) also living in their own homes, the median number was seven prescription and one non-prescription medicines.[12] A questionnaire-based study among the Residents of Retirement Villages of Victoria (Australia), where the residents are predominantly leasehold owners (mean age 79 years), showed that residents were using four prescription and one 'as-needed' medicines.[13] To our knowledge, previous studies have not compared the number of prescription and non-prescription medicines among the older-aged in different SES conditions. In our study, the lowest average number of prescription drugs was 4.7 per person in the freehold retirement village, whereas significantly more prescription medicines (6.7-7.4 per person) were prescribed to the residents in the two rental retirement villages. This suggests that living conditions/SES may be associated with the number of prescriptions used by the older-aged.

Cardiovascular drugs were the most frequently prescribed among the residents in all types of retirement villages, which is not surprising as cardiovascular disease is a leading cause of mortality and morbidity in older people. Psychotropic drugs were used by several residents in the rental, but none in the freehold retirement villages. As the residents in our study were living independently, it is unlikely that the psychotropic medicines were being used to treat dementia. Also, the antipsychotics were not being used concurrently with antidepressants or mood stabilisers, making it unlikely that these medicines were being used for bipolar disease. It is likely that the antipsychotics used in the rental villages were probably being used for schizophrenia. Adherence to antipsychotics for schizophrenia is notoriously low, with only one-third of subjects with schizophrenia being adherent, one-third being partially adherent, while the remainder do not take their prescribed medicines.[14] In our study, this low adherence to antipsychotics by the participants with schizophrenia in rental retirement villages would have been a major contributor to the overall reduced adherence in these villages, compared to the freehold village. **[Are you suggesting that low compliance may be due to the high use of antipsychotics for schziophrenia but there is no breakdown as to how many of the "Pscyhotropic and Neurologic" medicines are actually antipsychotics. How many are antidepressants? There is also a sentence which states that "it is unlikely that psychotropic medicines were being used for the treatment of dementia". Probably more correct to say "treatment of BPSD" as antipsychotics (which is what I assume you are referring to) don't actually treat dementia.]**

Finally, we considered whether there was any difference in medicines management between similar retirement villages in a metropolitan and regional city. A comparison was only possible for the rental villages, as there were low numbers of participants from the leasehold villages, and the only freehold village studied was situated in a metropolitan city. Our findings were similar from the metropolitan and regional city rental, catered retirement villages. This was unexpected, as health outcomes in Australia are generally poorer in regional than metropolitan cities.[15] However, the prevalence of cancer, diabetes, high cholesterol, ischaemic heart disease, and osteoporosis, all of which are common chronic conditions among older people are not greater outside of metropolitan cities.[15] This may have contributed to the similar findings between the rental villages in metropolitan and regional cities. Another reason for the similar findings in adherence and medicine management by residents in the rental villages may relate to the similarity in management styles of the rental villages regardless of geographical situation.

In conclusion, the older-aged living in low SES rental retirement villages may require assistance/resources to manage their medicines.

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